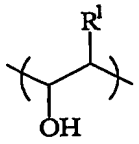
CLAIMS

1. A method for the manufacture of cross-linked polyvinylacetals, in which a polymer (A1) which contains in relation to its total weight

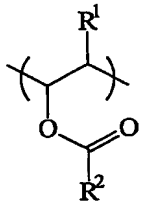
(a) 1.0 to 99.9 wt% structural units of formula (I)



(1)

where R^1 represents hydrogen or methyl

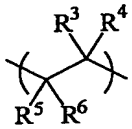
(b) 0 to 99.0 wt% structural units of formula (2)



(2)

wherein R^2 represents hydrogen or an alkyl group with 1 to 6 carbon atoms,

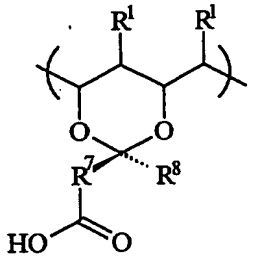
(c) 0 to 70.0 wt% of structural units of formula (3)



(3)

wherein R^3, R^4, R^5 and R^6, are in each case groups independent of each other with a molecular weight in the range from 1 to 500 g/mol,

(d) 0.00001 to 30.0 wt% structural units of formula (4a)



(4a)

wherein R^7 is a linkage, an alkylene group with 1 to 10 carbon atoms or an if necessary substituted arylene group with 6 to 12 carbon atoms and R^8 is hydrogen, COOH, an alkyl group with 1 to 10 carbon atoms or an if necessary substituted aryl group with 6 to 12 carbon atoms, wherein one in any sequence,

(i) reacts polymer (A1) with at least one polyaldehyde of formula (5),

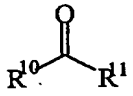
$R^9(CHO)_n$ (5)

wherein R^9 represents a linkage or a group having 1 to 40 carbon atoms and n is a whole number greater than 2

and

(ii) groups of formula (1) and formula (4a) at least partially esterified with each other,

2. The method according to Claim 1, characterized in that at any point in time at least one compound of formula (6) is added,



(6)

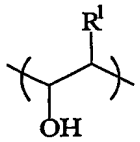
wherein R^{10} and R^{11}, are hydrogen, an alkyl group with 1 to 10 carbon atoms or an if necessary substituted aryl group with 6 to 12 carbon atoms, in each case independent of each other.

3. The method according to Claim 1 and/or 2, characterized in that a polymer (A1) with R^8 = hydrogen is employed.

4. The method according to at least one of the preceding Claims, characterized in that a polymer (A1) is employed, in which R^7 is a linkage or an alkylene group with 1 to 4 carbon atoms.

5. A method for the manufacture of cross-linked polyvinylacetals, in which a polymer (A2) is cross-linked, which in relation to its total weight contains

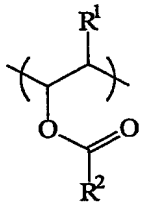
(a) 1.0 to 99.9 wt% structural units of formula (1)



(1)

wherein R^1 represents hydrogen or methyl

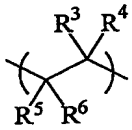
(b) 0 to 99.0 wt% structural units of formula (2)



(2)

wherein R^2 represents hydrogen or an alkyl group with 1 to 6 carbon atoms,

(c) 0 to 70.0 wt% of structural units of formula (3)

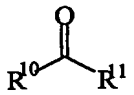


(3)

wherein R^3, R^4, R^5 and R^6, are in each case groups independent of each other with a molecular weight in the range from 1 to 500 g/mol,

characterized in that

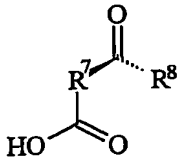
(i) the polymer (A2) reacts with at least one compound of formula (6)



(6)

wherein R^{10} and R^{11}, in each case independent of each other, are hydrogen, an alkyl group with 1 to 10 carbon atoms or an if necessary substituted aryl group with 6 to 12 carbon atoms.

(ii) at least one compound of formula (4b) is added



(4b)

wherein R^7 is a linkage, an alkylene group with 1 to 10 carbon atoms or an if necessary substituted arylene group with 6 to 12 carbon atoms and R^8 is hydrogen, COOH, an alkyl group with 1 to 10 carbon atoms or an if necessary substituted aryl group with 6 to 12 carbon atoms,

(iii) a polyaldehyde added of formula (5),

$$R^9(CHO)_n \qquad (5)$$

wherein R^9 is a linkage or a group having 1 to 40 carbon atoms and n is a whole number greater than 2

and

(iv) groups of formula (1) and derived from structural units of formula (4b) at least partially esterified with each other.

6. The method according to Claim 5, characterized in that at least one compound of formula (4b) with R^8 = hydrogen is employed.

7. The method according to Claim 5 and/or 6, characterized in that at least one compound of formula (4b) is employed, in which R^7 is a linkage or an alkylene group with 1 to 4 carbon atoms.

8. The method according to at least one of the preceding Claims characterized in that a compound (5) with n = 2 or 3 is employed.

9. The method according to at least one of the preceding Claims characterized in that a compound (5) is employed in which R^9 is an aliphatic, cycloaliphatic and/or aromatic group with 1 to 12 carbon atoms.

10. The method according to Claim 9, characterized in that glutardialdehyde and/or n-nonanedial is utilized as compound (5).

11. The method according to one of the preceding Claims, characterized in that n-butyraldehyde is employed as compound (6).

12. The method according to one of the preceding Claims, characterized in that
(1) 95.00 to 99.99 parts by weight at least of one compound (6)
(2) 0.01 to 5.00 parts by weight at least of a polyaldehyde (5) is added, wherein the parts by weight given is made up to 100.00 parts by weight.

13. The method according to at least one of the preceding Claims, characterized in that, the esterification (ii) or (iv), is if necessary carried out in presence of at least one softener, at bulk temperatures in the range from 80 to 280 °C.

14. The method according to Claim 13, characterized in that the cross-linking is carried out in an extruder, kneading device or another heatable unit.

15. The cross-linked polyvinylacetal obtainable by means of a method in accordance with at least one of the preceding Claims.

16. The polyvinylacetal in accordance with Claim 15, characterized in that less than 10.0 wt% of its total content is esterified and non-esterified in relation to the total weight of polyvinylacetal.

17. The polyvinylacetal in accordance with Claim 15 and/or 16, characterized in that it contains softeners.

18. Molding material containing a polyvinylacetal in accordance with at least one of Claims 15 through 17.

19. Film containing a polyvinylacetal in accordance with one of Claims 15 through 18.

20. The use of a film in accordance with Claim 19 for the manufacture of laminated safety glasses.

21. A coating containing a polyvinylacetal in accordance with at least one of Claims 15 through 17.

22. The use of a polyvinylacetal in accordance with at least one of Claims 15 through 17 for the manufacture of ionically conductive intermediate layers for electrochromic systems.